

Commodore HORIZONS

The independent Commodore magazine

75p December 1983/January 1984

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PRINTER SURVEY • ROBOTS FOR THE 64

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Submitting articles

UK £10.00 for 12 pages, overseas
surface (including US and Canada)
£14.00 for 12 pages, UK and Canada air-
billed £15.00 for 12 pages.

Submitting artwork

Commodore Horizons welcomes readers' contributions — either articles or program listings. Articles should be typed double-spaced with a wide margin. Programs should, whenever possible, be printed out on plain white paper, accompanied by a cassette. We cannot guarantee to return any article or program submitted, so please keep a copy. If you want to have your program returned you must include a stamped, addressed envelope.



Commodore Horizons is published monthly by Sunshine Books, Sun Press Ltd. Typeset by InStep Ltd, 77 Finsbury Road, London EC1. Printed by Bouverie Press Ltd, Thame Way, Wokingham, Berks, distributed by SM Distribution, 14-16 Trinity Gardens, London SW1Y 1DR telephone 01-274 8611, rates 50p/£1.50/£2.00. Registered at the Post Office as a newspaper. © Sunshine Books 1981.

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Commodore gives you the chance to win one of its disk drives

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Our look at Commodore's position in the market place

EDITORIAL

WELCOME TO THE FIRST issue of this new magazine for all users of Commodore's range — whatever your machine, and whether you're a games addict or a serious user, you'll find something of interest inside. We'll be back on the 13th of January with a February issue — by which time you'll have had a chance to let us know what you think of the magazine. From then on *Commodore Horizons* will be published on the second Thursday of each month, so keep in touch. And we've got one particular topic in mind — read on...

Commodore is a survivor. As a computer company it is one of the few which has withstood the cold winds of the price cutting war sweeping out the deadwood from the American computer industry. Commodore is sometimes blamed for the price cutting war. The company's policy is to cut its computer prices automatically in line with falling manufacturing costs — the greater the volume the cheaper the computer becomes, especially as a Commodore subsidiary, MOS Technology, makes many of the chips Commodore uses. It is good news for all of us that Commodore has now started to adapt its price cutting policy on computers to its software — much of the Commodore add-on equipment has been greatly upgraded the past few years.

Despite the size of the Commodore market worldwide, however, there are a very few firms producing Commodore software. This is most noticeable when compared to the hundreds of small, innovative software companies producing original material for the Sinclair Spectrum computers. We think it is time that these software companies started producing software for the Commodore range of machines. Why not join us in a campaign to persuade some of the Spectrum software houses to start writing software for the Commodore Vic 20 and 64?

We will need to persuade them that a market exists for their wares, which means that they have to hear from you. Write to the *Commodore Horizons Software Campaign* with your ideas and once a month we will mail the full list of names and addresses to over 100 software companies which, as far as we know, do not produce software for Commodore computers. Let's see these letters rolling in. And tell us what sort of software you would like to see.

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CHALLENGE

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LETTERS PAGE

Calling all pool players

I WOULD like some Vic 20 adventure games published because not many magazines have adventure games in them. Would it also be possible for someone to send in a snooker or pool program for the Vic?

Michael Cokell
Widnes
Merseyside

WHAT, WHERE'S IT? Keep reading the magazine and you'll find out if anybody has obliged. As for adventures, we'll definitely be doing some reviews and programming articles soon.

Unusual Vic features

SO MUCH attention has been placed elsewhere on the faults of the Spectrum that some very unusual features of the Vic have been neglected.

Plug a Vic 20 into a television and run this line:

POKE 1,010 TO BEEP/PING/CHIRP/BUZZ/BLINK
While this is happening, select relevant page 100. Sometimes random green letters appear in the top right-hand corner, where the time normally is.

Another point is that the documentation for the

Supercard cartridge is deficient. An extra command, Graphic 4, will give almost all the RAM to the user, but will crash the computer if graphic 0, 1 or 3 hasn't been previously selected.

Other things not mentioned are the fact that function keys can be programmed in a program, and that clouds can be placed in a PRINT statement.

Stephen Longstaff
London NW6

Confusion reversed

I BELIEVE some users may be confused by the colour sign for control 1 (red). This is shown in *Personal Computing on the Vic 20* as the reverse oblique stroke. Our page 113 — special symbols.

However, on our Vic 20 printing control 0 prints up a reversed 8 sign symbol. This caused a lot of confusion when we were first learning to use our Vic as some programs use one symbol and some the other.

I hope this will be of some help to other first-time users.

James Turner
London E8

Right royal request

I AM interested in submitting a utility program to your magazine to help users with their home accounting. It runs on a Vic 20 with +32 RAM. Before submitting the

program I wish to know how much you pay for programs and if you pay an outright price or a form of royalties on the amount of magazines sold.

R. G. Price
Croydon
Kings

I'M AFRAID you're not going to get rich by contributing programs to *Commodore Horizons* (which instead of the pleasure and privilege of appearing in print, we pay £6.00 for listings published in Software Plus, and up to £20 for our Star Games issue), so don't start thinking about royalties — our office ladies couldn't cope with the maths.

Simulation located

A RELIABLE version of simulated PRINT/AT uses the following Vic memory locations:

209-210/Poison 18 screen line 211/Poison of cursor on above line

214/Bow where cursor lives. The above is an extract from the Vic 20 programmers' reference guide.

My result is as follows:

1,1800 - 1,1210 = INT
1,02001 = A - INT
1,02002, 1,02003, 1,02004, 1,02005
1,02006, 1,02007, 1,02008, 1,02009
1,02000

Mark Harborth

July

Cassette aggravation

MY VIC was purchased as a replacement for a ZX81. When I originally purchased the ZX81 I also bought a good quality cassette computer compatible to go with it, and that is the problem.

Recently I wrote to Commodore and duly received a letter informing me that if I took my cassette recorder to my local dealer I could have it modified. The manager of my local dealer informed me that it did not carry out this type of work and was only an agent. They could forward my cassette recorder to Commodore but there would be a handling charge of about £10 plus the cost of the work to be carried out. At this

point he did say that other customers of his had experienced similar complaints. All that was needed in most cases, he said, was a cable with the appropriate plugs and fittings to enable the cassette recorder to be used with the Vic 20.

Has other Commodore users overcome this problem? If so, could they supply information where the parts can be purchased and how the work is carried out.

Terence Webb
Bathurst
Cornwall

Interpreting the words

I HAVE been interested in micro-computers for well over a year now from the point of it becoming a musta sometime but to date have only "played" with those machines on screen in shape.

Now has come the time to buy one and after much deliberation I have decided on the Commodore 64, mainly for these reasons:

1. The built-in music synthesiser seems to be more advanced than in other micros of same price.

2. The 640 RAM (it would cost me more to upgrade a Vic 20 to the same capacity, and besides that I hate the 25 x 16 screen display).

But in the C64 it does state it states that "existing Vic and all releases Pet Basic programs can be easily converted". I would like to know just what "easily" means. I think Commodore do this and they said it's practically a complete re-write this is in my idea of being easy.

One would think that Commodore would have designed a conversion cartridge to plug into the rear part of the unit which would enable direct input of Vic software.

M. R. Price
Magenta
London

This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons, 13-15 Little Newport Street, London WC2B 3ED

"I mean you didn't really expect your name was written in a great big thumping not-better font like it is, did you?"



INTERPLANETIC LAMMAS BATTLE AT THE EDGE OF TIME
The first ever interplanetary war game, *Interplanetary Lammastide*, is now available for the Apple II computer. It's a futuristic, space-based game of strategy and combat. The game features a variety of units, including tanks, aircraft, and space ships. The game is set in a futuristic world where the forces of good and evil are locked in a fierce battle for control of the universe. The game is designed to be played by two players, and it features a variety of different levels of difficulty. The game is available for the Apple II computer, and it's sure to be a hit with anyone who enjoys strategy and combat games.

LAZER ZONE

LAZER ZONE is a futuristic, space-based game of strategy and combat. It's set in a futuristic world where the forces of good and evil are locked in a fierce battle for control of the universe. The game features a variety of units, including tanks, aircraft, and space ships. The game is designed to be played by two players, and it features a variety of different levels of difficulty. The game is available for the Apple II computer, and it's sure to be a hit with anyone who enjoys strategy and combat games.

ATTACK OF THE MEXICAN CAMEL

ATTACK OF THE MEXICAN CAMEL is a futuristic, space-based game of strategy and combat. It's set in a futuristic world where the forces of good and evil are locked in a fierce battle for control of the universe. The game features a variety of units, including tanks, aircraft, and space ships. The game is designed to be played by two players, and it features a variety of different levels of difficulty. The game is available for the Apple II computer, and it's sure to be a hit with anyone who enjoys strategy and combat games.



MATRIX

MATRIX is a futuristic, space-based game of strategy and combat. It's set in a futuristic world where the forces of good and evil are locked in a fierce battle for control of the universe. The game features a variety of units, including tanks, aircraft, and space ships. The game is designed to be played by two players, and it features a variety of different levels of difficulty. The game is available for the Apple II computer, and it's sure to be a hit with anyone who enjoys strategy and combat games.

MYSTIC BOWER

MYSTIC BOWER is a futuristic, space-based game of strategy and combat. It's set in a futuristic world where the forces of good and evil are locked in a fierce battle for control of the universe. The game features a variety of units, including tanks, aircraft, and space ships. The game is designed to be played by two players, and it features a variety of different levels of difficulty. The game is available for the Apple II computer, and it's sure to be a hit with anyone who enjoys strategy and combat games.



ABSTRACT

ABSTRACT is a futuristic, space-based game of strategy and combat. It's set in a futuristic world where the forces of good and evil are locked in a fierce battle for control of the universe. The game features a variety of units, including tanks, aircraft, and space ships. The game is designed to be played by two players, and it features a variety of different levels of difficulty. The game is available for the Apple II computer, and it's sure to be a hit with anyone who enjoys strategy and combat games.



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A Portable feast

THE CR30 64 portable computer will go on sale in Britain before Christmas, according to Commodore UK's marketing manager, John Mason.

First shown at the Chicago CES show in June, the CR30's launch in the US is now "imminent".

The CR30 has 64K RAM and is based on the 6502-compatible 6510 chip. It has a built-in 6 inch colour monitor and single floppy-disk drive with 1788 storage capacity. The detachable keyboard is of the full-size full-travel type.

The unit has cartridge, cartridge and monitor ports and is compatible with Commodore 64 software and peripherals, including the television set.

A 256 cartridge slot is planned for the CR30 to make it CP/M compatible.

Languages planned include Pascal, Logo, C, BASIC, Assembly and Pilot.

No UK price has yet been fixed but its US tag of \$999 would suggest a price of around the £699 mark. A review of the machine is scheduled for next month.

Commodore gets that tip-top feeling

COMMODORE now claims to be the top-selling UK home computer company.

A spokesman for Commodore said that reports from retailers indicate that "unit sales of the Commodore 64 and Vic 20 machines now exceed sales of the Sinclair ZX Spectrum and ZX81 models", Commodore's closest rivals.

"We have been British based leader in selling sales for some time, but now we are ahead in units, bringing us into line with the situation in the US," the spokesman added.

In the UK it is now estimated that Commodore has captured

43% of the £1.1 billion market for under-£1,000 personal computers. Its nearest rival, Texas Instruments, is estimated to have a 25% share of the UK market, with Times marketing the Sinclair machines only 9%.

In recent months, during a fierce US price-war, Commodore has broken ahead of its American rivals, many of whom — Atari, Texas and Mattel — have reported heavy financial losses.

Indeed, so damaging has the price-cutting been in some that Mattel has indicated a wish to withdraw from the home

computer market — and Atari announced in October losses of over \$100m for the third successive quarter.

Commodore, surprisingly under these circumstances, has announced record annual profits, up to \$44m on sales destined to over \$600m. Commodore chairman Jack Tramiel attributed the growth largely to "extremely strong demand for the 64".

In the UK Commodore has stepped up production of the 64 to try to ensure sufficient stocks for Christmas, but it already seems likely that demand may exceed supply.

Precision offers database potential

SUPERBASE 64 is a new programmable database and information retrieval package for the Commodore 64 from Precision Software.

At its most straightforward Superbase 64 offers the user a menu-driven system within which individual record structures can be built up. The database can hold up to 12

files, each containing an unlimited number of records. Each record can contain up to 10,000 characters spread in up to 127 fields spread across four screens.

Within these constraints you can build up whatever record or file structure you wish.

However, with Superbase 64, you can go one step further. With the user-programmable interface part of the package you can adapt the database software to your own precise requirements using the Commodore 64 Basic in conjunction with 70 additional Superbase Basic commands. Superbase 64 is on.

Says Precision's Peter Thomas: "You can build almost any specialist application you want. For example, if you want an accounting system you can build one with very little work."

In the next six months the company plans to release a range of add-on software packs for Superbase 64, developed using the Basic extension — providing, to start with stock control and accounting.

Superbase 64 is available on disk, complete with a 208-page manual, priced at £99.95.

Rose blossoms at Phoenix

PHOENIX Software is a new games company set up by Gerry Bates, one of the founders of the predominantly Vic 20 software house Razzmatazz.

The new company has an interesting idea — it will sell interactive games combining both an arcade-style game and an adventure-type program.

Before you can begin to tackle the adventure you must master the arcade game, giving you access to the loading code for the adventure. Also, clues for solving the adventure are revealed as the arcade game play progresses.

To begin with Phoenix has two titles for the Vic 20 and one for the Commodore 64.

In Four Gates of Freedom for the Vic 20 you must first destroy the four gates which bar your way, before entering the cavernous halls of the planet Solana to rescue 20 scientists trapped in suspended animation.

In The Sorcerer's Apprentice for the Commodore 64 you must temporarily trap the brooms from broiling water. Then you venture into the sorcerer's castle in search of the spell to put paid to the brooms once and for all.

All titles are priced at £9.95.



BY THE END of November Channel 4 Software should have completed conversion of all 18 Mysterysoft Adventures from Digital Fantasy for the Commodore 64. The 40 titles are all computer-style graphic adventures written by Brian Howarth. The Golden Series, Arrow of Death 2, Arrow of Death 3, The Time Machine, Cirrus, feasibility experiments, escape from Pohar 2, The Wizard of Azyk, Petulant and Andromeda and Ten Little Indians. Each of the titles is priced at £9.95, available on cassette.

SOFTWARE

The software for plasma is to test the product's **degradation profile** or **relative carriage** in state of art and measure its **decay rate** (determined in the **product** object). Products can have **multiple** decay curves because the product has **multiple** **degradation**. For product types **1** and **2** (e.g., **SOA**, **SOI**, **SOI** **advertisers**, **SOI** **other** **advertisers**), **1** **contains** **one** **business**, **1** **maps** **customer** **data** **statistical** **information**, **1** **uses** **the** **advertisers** **information**, **1** **communicates** **the** **business** **information** **between** **1** **and** **customer** **information** **using** **message** **bus**. **Multiple** **businesses** **can** **exist** **in** **the** **product** **object**. **Business** **1** **uses** **the** **advertisers** **information** **to** **communicate** **the** **business** **information** **between** **1** **and** **customer** **information** **using** **message** **bus**.

The Six-Four Supplies Company is THE supplier for the Commodore 64. Our range of products in support of this machine includes a wide range of peripherals, devices and software to cover the needs of home and business user alike. We intend to offer an unrivalled selection of products, covering every aspect of using a Commodore 64.

HARDWARE

| Department | Number of employees |
|-----------------------|---------------------|
| 1. Administration | 10 |
| 2. Production | 100 |
| 3. Sales | 10 |
| 4. Research | 10 |
| 5. Quality Control | 10 |
| 6. Purchasing | 10 |
| 7. Financial Services | 10 |
| 8. Human Resources | 10 |

| Standard Anthology | Book Review |
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| 100 Essential Poems and Stories | 100 Essential Poems |
| 100 Essential Poems and Stories | 100 Essential Poems |
| 100 Essential Poems and Stories | 100 Essential Poems |
| 100 Essential Poems and Stories | 100 Essential Poems |

Read more for more information and examples of how to use natural language editing.

ANSWER

Please note that the following is the first English language edition of the book and that certain parts of the text are not yet available.

The Six-Four Supplies Company

And now . . . Revenge of the Mutant Camels

JEFF MINTER of Liverpool is working on a new game for the Commodore 64 — *Revenge of the Mutant Camels*.

In it you take the role of a mutant camel, fighting back against the camel's defeat in Jeff's previous arcade action, *Attack of the Mutant Camels*.

You have three mutant camels with which to win your way as far as possible through more than 40 attack waves.

Each screen has a different theme — in Rock and Roll you are attacked by huge boulders, and in mutant cigarettes, in other screens you may encounter mutant camels!, a figure called Bigfoot, surfing waves and, worse of all, Music Makers.

Your camels can fire in eight



Jeff Minter: "The camels jump in a really ludicrous way"

directions and can jump. Says Jeff: "The camels jump in a really ludicrous way and when they sit down they look very silly. It's good."

The new 64 game should be

finished by mid-December — price £1.99. Then Jeff will start work on his next Vic 20 game, that follows up to *Mystagala* for Lucas Radio at the Edge of Time.

Corby factory in full swing

PRODUCTION of the Vic 20 and Commodore 64 machines is now in full swing at Commodore's new plant in Corby, Northants.

Over 1,000 computers a day are coming off the production lines, only eight months after

Commodore announced its choice of Corby for the £20-million plant.

The new factory is the centre for European manufacturing of home and personal computers — one of four such sites worldwide — and machines

from Commodore are exported to the rest of Europe, Scandinavia and Africa.

At present the Corby works employs 1,400 people, but Commodore is currently negotiating a loan from the European Coal and Steel Community to allow expansion in 1984. This would more than double the numbers employed and push the number of computers manufactured per year at the site over the 3 million mark.



COMMODORE is currently out to score points with British sportmen — especially the basketballers. The English Basketball Association has invited a £75,000 two-year sponsorship from the company over the next two years. In the past Commodore has devised and operated a unique scoring program for the association which allows information to appear instantly on the screen during TV transmission of games.

Cheaper printing

If you are looking for an inexpensive printer option then Softek Computers in Bournemouth may have the answer.

For £29.95, the company is offering an interface and power-supply that will enable the low-cost Sinclair thermal printer to be used with the Vic 20 or Commodore 64.

Softek supplied with the interface converts the Commodore character set into the dots printed by the Sinclair ZX Printer and provides a number of control commands. Softek will also supply the package complete with a ZX Printer for £119.95.

Alice makes you wonder

Alice in Wonderland is a new disk-based graphics adventure for the Commodore 64 that looks like setting the standard for future releases.

Following the story of the original Lewis Carroll book closely, the adventure takes the form of a sequence of eight-related arcade-style games featuring an animated Alice figure.

What marks the game out are the outstanding quality graphics and the continuous soundtrack of music.

Alice has been developed by a US software house and will be available in the country through Analogique. No date of arrival or price have yet been set.

Stack promises all the fun of the fair

THE STACK Light Rifle is a new idea for the Vic 20 and Commodore 64.

The rifle, when connected to the computer using specially developed software, can be used in "Alice" targets games.

The device detects a hit or a miss by computing the time the trigger is pulled with the time it takes from starting a beam to reach the point you are aiming at.

When the beam reaches the point on the screen at which the rifle is aimed, light from the rifle activates a light-sensitive

cell inside the rifle barrel.

The rifle will only work with software written specially for it. So far Stack developed six titles: Bars and Cats, Crew Shoot, High Noon, Glorious Twelfth, Escape from Atlantis and Big Game Safari.

The Stack Light Rifle will be available from mid-November and is supplied complete with three games titles, at a price of £9.95.

If you think you've something newsworthy, call 01-407 4040 and let us know.

Commodore brings out a mixed batch

COMMODORE Business Machines are more usually known for their hardware than their software, but this month sees the start of a determined campaign on their behalf to break into this lucrative market.

We've picked out some of their games for both the Vic 20 and Commodore 64, and to get the ball rolling we'll start with the all-side of things, and the last-ditcher named Maggot Mania.

This Commodore 64 game is supplied on cassette, and although you have the option of using either a joystick or the keyboard to control the game's events, those of you with less than 20 fingers would do well to use a joystick.

Like so many other games this one falls into the category of versions on a theme, as it is nothing more than a poor impersonation of the arcade favourite Centipede.

Garden defender

For those unfamiliar with the game, Centipede (and Maggot Mania) cast you in the role of defender of the garden, a sort of Jack Roger meets David Bellamy, who has to fight off hordes of maggots, spiders and snails. The maggots are merely intent on eating you, and with their way about the screen commanding off any flowers that happen to get in their way.

You, being a little creature, cannot cannon in the same way, as any collision on your part with a flower results in the loss of a life. Spiders enjoy similar luxury to the maggots, and they make occasional forays into the garden in the hope of snapping you off.

The snails aren't particularly dangerous, and provide you with a 1,000 point bonus should you hit one before it destroys too many flowers.

In action it's a lame-tow-inspiring version of an arcade favourite, and on the 64 version not looking more like a shoddy version of the slightly popular Goldrauner. From that company schooled with Llamas.

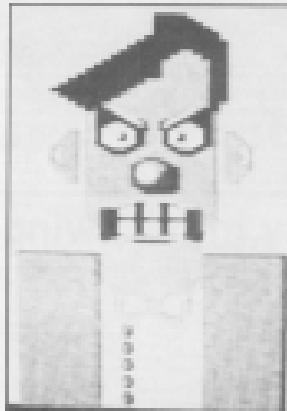
Your little creature is confined to the bottom two rows of the screen, and when some of the maggots inevitably get past you, they race about at breakneck speed in a frantic effort to collide with you and then leave another of your lives.

Response from the joystick is quite reasonable, but overall the sound and use of graphics are merely hinting at the power of the 64, and are by no means using anything other than a fraction of the capabilities provided.

A poor game, considering what could have been done. Stick to the arcade, if you

SOFTWARE REVIEW

Pete Gerrard takes a long, hard look at the software Commodore itself puts out



Now, after a good 'one' for the 64, like demolishing maggots, spiders and snails, a patrimonial delight.

Farmer Lander, a familiar-sounding title from the dawn of computer games, turns out to be another flop. In its current guise, after appearing under names such as *Lunar Lander* in the early Pet days, it first appeared on the Vic 20.

Little and lesser

The version produced for the 64 has hardly changed at all from the Vic version, and is as boring now as it was then. About as exciting as making toast.

The object of the game is to land a spacecraft on the surface of the planet Jupiter, a surface which has strange platforms on it, with bonus scores written on them. Carl Sagan, eat your heart out.

Using either joystick or keyboard, you have to manoeuvre your spacecraft left or right, and your only other control is over the thrust of the rockets.

A delicate hand on the controls is required as initial experiments with the game left me failing the NASA initiation test and taking giant leaps into outer space again. Jupiter seems a bit too big to miss altogether, but when your only control is a joystick, it's all too easy.

This game is boring. The initial screen shows three platforms on the surface of the planet, which give you either 2, 3 or 10 bonus houses for achieving a successful landing. When you near the top of one of these platforms the screen image expands, and a single platform fills up the entire playing area.

Unless you're an extremely dab hand at controlling the joystick, and manage to land at precisely the right speed, exactly in the middle of the platform, it's back to the launch pad as another ship loses the data.

Once you have got the hang of it all, the game ceases to be whatever minor interest it might once have held, as there are no additional bonuses, no speeding up of the action, and no changes. You just keep on landing on the planet, then going back for another go again.

The one virtue of this game is that it is supplied on a cartridge, so you won't waste several minutes waiting for it to load.

Send in the clowns

Clowns: At this stage, after ploughing through the first two games, this simply summed up my opinion of Commodore for bothering to put them onto the market at all.

But *Clowns* did at least manage to rescue some of my faith in their ability to write computer games even if, like so many other games, this one is about as original as most of the music in the current top 20.

Clowns first appeared for the Commodore Pet back in 1979, and once more this new version for the Commodore 64 (supplied in cartridge format again) has added very little to the original game.

You control a little clown on a seesaw who has to balance it under another clown who has, hamster-style launched himself into space from one of the four platforms on the edge of the screen.

If you manage to position this see-saw correctly, the impact of the clown landing on it sends another clown sailing towards the top of the circus tent (otherwise known as the top of the screen) where, boxer-like, he has to beat one of a succession of balloons passing across the top.

There are three rows of balloons, in different colours just to show that the Commodore 64 has got colour, and clearing whole rows of balloons rewards you with various bonuses. Each balloon is also worth a few points, depending on its colour.

One thing that is noticeable about the packaging purely by its absence is a warning saying that this game requires the Commodore games paddles in order to play

it properly. No joystick controls, no keyboard controls, so unless you're one of the very few people who have a set of paddles, this will not be the sort of your most interesting games.

Once you do get started it is actually quite addictive, as your little cheese-hunting mouse runs, leaping up and down on the screen and eating all the cheeses that they can find. The action goes faster as you progress, although you can get a satisfying high score by hardly moving at all, once the rhythm has built-up.

To conclude, quite fun, but ultimately one has to say that the 64 deserves better than this. And they should have said something about those paddles!

Radar Rat Race

Radar Rat Race — a game about something perhaps? No, no, this one puts you in the role of a blue rat, being chased by a horde of red rats, gobbling up cheese as you move around the screen, and attempting not to bump into any of the shifty rats the last about.

The screen display is quite imaginative. The left-hand side of the screen shows only a part of the entire maze in which you find yourself. The right-hand side contains all the details of the scores, bonuses, lives left and so on, together with a miniature map of the whole maze, showing where all the cheeses are to be found.

Since your little blue rat requires a lot of cheese before he can progress to the next level, this comes in quite handy. Of course, one could say it is there to make the program's life easier when controlling spores, but that would be uncharitable.

Once again this comes in cartridge form, and this is much to be preferred to tapes or disks. It's much more reliable, and takes just seconds to install.

Using a joystick as your control, the action is fast and furious, as the chasing red rats. Once on the first level it shows an amazing ability to find and chase after you. They can put off the screen for a while by sprouting a smoke screen behind you, but you've only got a limited amount of smoke, so be careful.

One of the lungs of cheese is a special one, which doubles the score you get for eating any other bit of cheese. At least, it does and you lose a life.

Getting through one level brings you to screen two with four rats after you, getting

through this one brings you to the main speed run, where you have the entire time allowance (as very generous to eat all the cheeses before the first supernova red rats come after you. When they start, you have no chance! They move at least twice as fast as you can, so you might as well desert the sinking ship and start another game immediately).

It is a good game, and certainly the best of Commodore's 64 batch.

Fast Action could be the result of playing too many games in one day, but in real life it is a family entertainment game for the Commodore 64.

Back to caution for this one, and after waiting nearly seven minutes for the game to load, you really appreciate cartridges.

The time spent waiting can be filled up by reading the interestingly condensing information sheet supplied with the tape. This describes the action in words of few syllables, and in pixels we are told that the screen will fill with a hilarious collection of faces. After you've managed to control your hysterical laughter, which isn't too difficult, the game proper commences.

Once again the content has to be made due, for a graphical machine, this program does little to show you any of the features available, as everything is done in scratchy chunky graphics.

Memory Test

A face will appear on the screen, and after five seconds disappear again. From memory you then have to re-create the screen face using a variety of commands.

Separate keys control the hair, eyes, nose and chin, and using a combination of the ten you have to re-create the earlier face. A good memory tester with the rewarding bonus of frequently winning less than half marks when producing the face. However, by the time you've drawn up half a dozen different gangsters on the screen, the interest begins to wane, and the fingers look elsewhere for something different to do.

A good game for the times amongst us, and, as a memory test, it does have a hole to play in the educational world, but first they would have to re-arrange the instructions, which really are quite dreadful, and perhaps do something about the graphics. They are reasonable, but the 64 could do better. Half marks for trying.

With Sea Wolf it is back to cartridge again, and just as well, otherwise a few

more minutes would have been wasted.

I dispute of software companies at times, and with this program being the result of a joint venture between Commodore and the electronic genius of Bally, responsible for many of our best arcade and pinball machines, there is really no excuse.

Quite simply this is appalling, and why anyone wasted money on getting it onto the market is beyond me. You are in charge of a scale submarine placed at the bottom of the sea and screen, handling a limited supply of torpedoes to shoot up at the ships passing above. Different sizes of ships score different points, and needless to say the smallest, fastest ships get you the greatest points.

Paddles needed

There is a time on the game although this can be changed if so required. Once again you have to use a set of paddles, as there are no options for keyboard or joystick control of either of the submersives in this two-player game.

I tried hard to find a redeeming feature in the game, I really did, but there just isn't one. All you have to do is sit at the bottom of the sea and launch torpedoes up at the never-ending parade of enemy ships above.

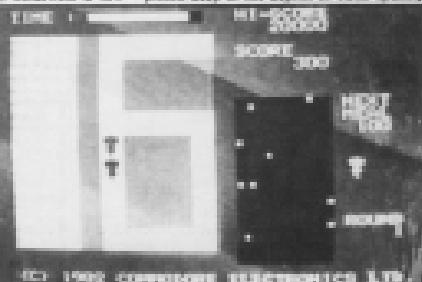
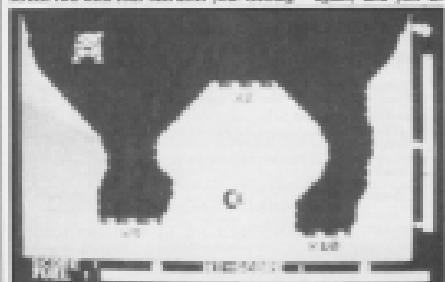
There is no radar control, no movement of your submersives, no decent sound effects, and better graphics were achieved on the earlier Commodore 64 versions of the same game (basic colour of course).

One could groan, but why bother? If this is Commodore's attempt to attack the software market, they're in for a long winter.

Commodore have also a series of arcade games for the Vic 20, some old, some new, but the overwhelming impression of this game is that they are much better than Commodore's own games for the Commodore 64. Why, why, why?

Commodore Jukebox, based on the arcade game of the same name, first appeared as a PET game in 1986, written by one Derek Hipkiss. Whether he is the author of this Vic version I don't know, but this is a faithful reproduction of that PET version.

Supplied on cartridge, you can use either the keyboard or a joystick to control the action, and for once the keyboard is just as easy to use. You are a little spaceship at the bottom of the screen who can move left and right, and who has the job of passing a prison deep in the depths of outer space.



Another Lander needs a different touch on the controls

Radar Rat Race: the action is fast and furious

• In this prison are those offending aliens, and they are surrounded on all sides by rows and rows of blocks. But, there is a 'jailbreak a'comin' as hordes of other aliens are lined up in formation at the edges of the screen, intent on stopping in between your fire and stealing the blocks of the jail, one at a time.

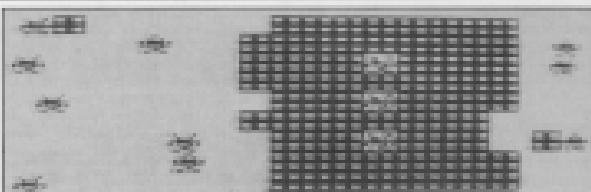
As they move back and forth they are also firing at you, and your trust Space Invader type defences soon begin to crumble under the onslaught.

Occasionally one of these aliens will go bankrupt, and while the rest stand still will run about like an alien possessed, stealing blocks at a rapid rate. A mysterious master ship also appears from time to time at the top of the screen. High bonuses can be achieved by napping this one but it counts double.

Everything goes along at a nice lish, and by the time you arrive at level three you more things begin to happen. Between levels the jail may or may not be rebuilt, depending on how many lives you've got left, and how many prisoners are still in the jail.

On the third level, an ewing appears directly above you, and he can only be killed by shooting him at the edge of his body. By the fifth level, a terrible chorus line of aliens is dancing above your ship, and when you eliminate all five of them, the entire lot reappears and starts bobbing about again.

This is a superb game, with so much happening. Supplied on cartridge, it



Cost: £19.99. A superb game giving lots of action for your money.

Isaac Asimov, a superb game giving lots of action for your money. Is it easy, difficult. Once you've started moving in a given direction, stopping and changing direction is virtually impossible, and you just have to sit and wait while your ship blunders seemingly around the screen, crashing off walls and the block until it finally comes to a rest. That's inertia for you.

While you blunder about, the aliens come after you, and there are a number of different types of nasties, each with their own little trick up their little alien sleeves.

This game is fun, and even if you do start blithely bumping into things, it should at least provide a few laughs along the way.

By the time you've worked out how to control the ship properly (30 games later), the game does begin to make more sense, and you can get on with the job of saving the universe. Zapping different aliens generates different scores, and everything, as usual, just goes faster and faster as it goes along. From level to level. Another good arcade game for the Vic. ■



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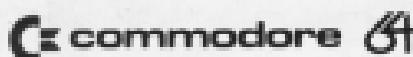
 

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All the pleasures of printing — and some of the pain

Pete Gerrard discusses the range of printers on offer for Commodore users, from daisywheels to dot-matrix models — and offers some advice to *inquisitives*

ANY COMPUTER that takes itself as seriously as Commodore can be connected to a wide variety of printers, covering such diverse interfaces as IEEE, RS232 and Centronics.

However, earlier Commodore computers, before the company branched into the home market with the 64 and Commodore 64, were blessed with a peculiar version of an IEEE interface. While a smart purchase would give you the opportunity of hooking up to many standard IEEE printers, it would also leave you £15 worse off. A little bit more expenditure could expand your world to include a reliable host of RS232 and Centronics printers, and we'll be taking a look at just some of the printers currently available later on in this article.

One, two, three...

Of course, you could always use Commodore's own printers, ranging from a relatively inexpensive dot matrix printer to a (not-un-relatedly) expensive daisywheel

printer. The speed of the latter device must have left many people thinking that they could type faster themselves.

Owners of Commodore 64 and Vic 20s won't be in a less fortunate position, in that the interface provided on these two computers is more compatible with existing other than Commodore's own peripherals. The dot matrix printer issued by Commodore itself is not only incredibly expensive, but also very slow in operation, and very, very noisy.

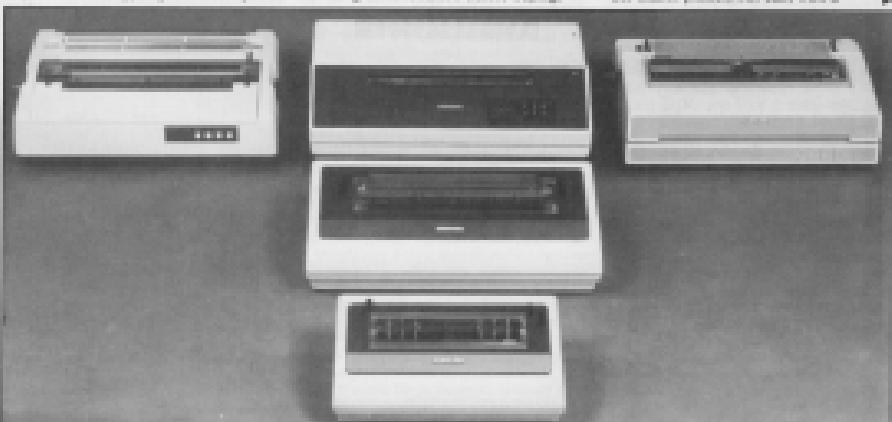
Enterprising manufacturers, ever quick to make a fast buck or two, have produced a whole collection of interfaces which allow your humble home computer to connect up to all of the interfaces mentioned earlier. But, however, interface buffers, not every computer will work with every piece of software. Word processors, one of the primary reasons for acquiring a printer in the first place, are very fussy about which interface you use, so insist on seeing a working demonstration before buying.

The type of printer that you get will be largely determined by the work to which it will be put. If it's use is to be primarily private, producing ledgers and internal reports, the chances are that you'll be able to get away with buying nothing more than an ordinary dot matrix printer. The quality of the output won't be too great, but it will certainly be legible, and a good dot matrix should be able to whiz along at speeds well in excess of 100 characters a second.

... quick, quick ...

If the printed material is to be used by anyone other than yourself, for instance, in a company using the printer as part of a word processing system, you'll probably have to spend rather more money and be prepared to put up with a slow, but high quality, daisywheel printer.

Some of the devices now available allow you to mix these two print types to a limited extent, so that they will normally act as a dot matrix printer, but can, with a



Some of the range of Triumph Adler... which offers one of the cheapest daisywheel printers along with dot matrix models

technique known as double striking (simply, printing the image twice), produce a reasonable approximation of the type of output more commonly associated with a dot-matrix printer. As ever, you pay your money and take your choice.

Few printers, other than Commodore's own, will allow you to reproduce the graphic character sets found on the actual computer, although most of them will allow you to define characters and produce, for example, dot by dot copies of the screen. However, this requires some software to be written by you, the user, so it will stick to straightforward printers, starting with the D880, which can operate in either RS232 or Commodore modes.

Incidentally, all of the printers listed here can be used with any of the Commodore range of computers. You'll just have to get the interface appropriate to your own machine.

The D880 128, which is distributed by Triumph Adler (27 Grosvenor Road, London PC03 9CT), is a 120 characters per second dot-matrix printer, with the ability to print bidirectionally. The number of characters printed per line is software selectable, and can range from 128 to 216, although this latter mode is the type that requires an extremely powerful magnifying glass.

... above

All sorts of character sets are available with this printer, but at a price of £875, you may care to take a look at the slower, but cheaper, D880 80/91. Again from Triumph Adler, this is down to 80 CPS and £495. Apart from having only a 140 column line at maximum, the other real difference between this machine and it's big brother, the D884 128, is the print speed. And, of course, the price.

Chances still, at £998, is the Facit 410 from Facit-Radios (Mandeville Road, Rochester, Kent ME11 1PN). This is a 120 CPS dot-matrix printer, with a column width of up to 80 characters, which is expandable down to 12 columns, should you so desire it. There's quite a wide range of character sets available, and also a number of different print modes, including condensed and compressed. This can be linked up to either Commodore or RS232 interfaces.

The next lot of printers are by Epson (Dordland House, 288 High Road, Wembley, Middlesex, HA9 9UH). Epson has long been known for producing good, cheap, dot-matrix printers, and its latest range of models has done nothing to harm that hard-earned reputation. Their one failing, perhaps is the ludicrous combinations of letters they go under. Thus we get the RS-404FT, which is closely related to the FX80, which in turn relates to the FX8 series of printers, and so on. Why can't they just have names?

Anyway, coming back, the aforementioned RS-404FT is a 100 CPS printer with a variety of typefaces and sizes, supplied with a Commodore interface (although this can be converted into either RS80 or RS232 if required), and capable of taking either friction feed or tractor feed.

At just £1098, this is worth considering, as it is slightly more expensive big brother the FX80, this costs £1498, but has the ability to print at almost twice the speed (200 CPS), and produce near letter quality output, as it's possible to double strike everything. Best of all the printers listed at here, the FX80 has got to be a personal favourite. I've owned one for a number of months, and have yet to find a problem with it. The range of commands is, at times, superior to the range of commands on the computer that's driving it! A fine printer, with an excellent manual.

Finally the latest dot matrix printer that is readily available for any Commodore computer is the D885 250, again from Triumph Adler. This runs along at the amazing speed of 250 CPS, and comes complete with either an RS232 or a Commodore interface.

However, if the computer that you happen to own is a Vic 20 or a Commodore 64, there comes little point in paying around £200 for a computer, and then another £1499 for the printer to go with it. Personally, when the printer costs seven times as much as the computer, I feel that the time has come to go elsewhere. If you're currently stuck, obviously the D885 250 has a lot to recommend it. If you're like the majority of us, it's either bankruptcy — or try the Epson FX-100. This is the latest and greatest dot matrix printer to come out of the Epson stable, if the specification sheets hold true.

At £1588, the FX-100 has everything that the FX80 has, including the 100 CPS print speed, optional interfaces of every kind, and superb graphical facilities, but it also has a much wider carriage. A short little number, it should sell by the thousand.

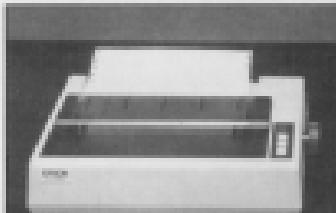
Many companies seem to make a living out of impersonating Epson printers, and indeed the early Commodore printers for the PET range of computers were cut-down versions of Epson models. This is not a bad thing (imitation is the sincerest form of flattery, and all that), but should check whether the printer you're thinking of buying isn't already available from Epson, at a much cheaper price.

Small type

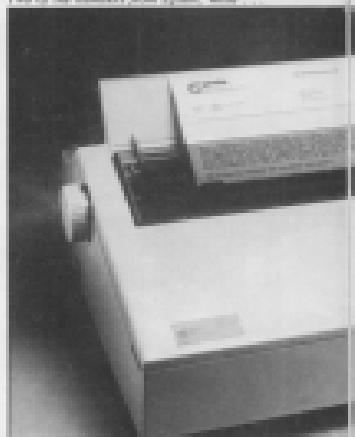
But we digress. When examining specification sheets for printers, obviously they will all try and charm you with a wonderful range of capabilities. Most printers, however, do have a failing somewhere along the line, and this is either not mentioned, printed in minuscule type, or disguised in some way.

The most common failing is in speed of printing, and a phrase often used by manufacturers to hide a slow print speed is that lines have per minute, instead of characters per second. By using LPM instead of CPS they can still put down a large number, and hope that most people won't think it to be a slow printer. While 25 LPM sounds quite good, remember that a line is typically 80 characters across, and that 80 times 25 equals 4,000 characters per minute (20 CPS). This is not quite as fast as it first sounded.

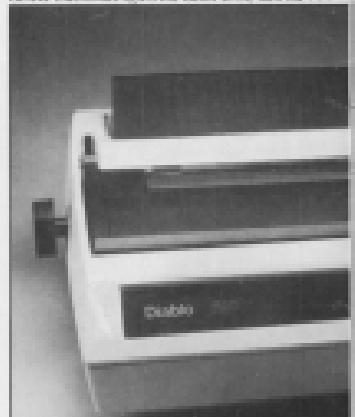
All this is by way of introducing the



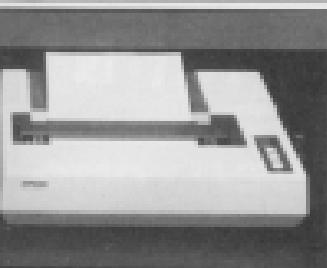
One of the answers from a printer, above



Another Electronics offering the Epson FX-100, with the...



Another Electronics offering the Epson FX-100, with the...



Imprint CX 80, which looks like an early Commodore printer, prints at the aforementioned 20 LPIPS (although, to be fair, it can print at 120 CPIPS in certain special cases, like printing line after line of the same character), and with a Commodore-compatible IEEE interface will set you back some £550.

As a pure graphics printer it has many advantages over other conventional dot matrix printers, because it has a choice of seven different colours to print in, and a dot-addressable print facility. However, program listings in high resolution printed in seven different colours tend to look a little odd. Unless your need is a highly graphical one (in which case contact DSV Computer Services, Wye Craft Industrial Estate, Marlowe, Old Road, Rhodes, Marlowe, Great Marlow, M24 8PZ), we'll go back to ordinary printers, and look at a little number from Marconi's Tally.

Marconi was at one time supplying Commodore with printers, although I believe that agreement was discontinued a while ago. Still, it is continuing to produce the MT80, which is a £799 Commodore-compatible 80 CPI dot matrix printer. Marconi seems to have gone all out to be compatible with anything else currently available, as the MT80 can handle all the Epson codes, as well as having a number of its own. Any one of a million different interfaces (well, quite a few) can be hooked up to this one. It is also versatile, a boon if you happen to be new on the thing all the time it's working.

Daisywhips

But enough of dot matrix printers. One at least in the above collection should suit most people. As many people using Commodore computers for pleasure will probably also use them for business, we'll turn our attention to some of the daisywheel printers currently available.

All of these will work with a Commodore 64 or 128, provided that a suitable interface is connected to the interface — which comes from Oxford Computer Systems, Bramington Road, Woodstock, Oxford OX8 1RR. But as most of them cost upwards of a thousand pounds, they will probably be of more interest to the business user. Still, if you own one of the home models and fancy a little bit of later quality printing, read on.

One thing that just about all daisywheel printers have in common is that they are slow. Thus their primary use would not be in producing program listings, but in printing out letters, reports, menus, etc. You don't buy a daisywheel printer to run adventure programs.

Triumph Adler, mentioned earlier when talking about dot matrix printers, produces possibly the cheapest daisywheel, the TR83 1708, which costs £725. This is not the latest of printers, at just 17 CPIPS, but it is of a high quality, and it is also quiet. A maximum of 199 extremely small characters can be printed across a line, and with a wide range of optional interfaces, covering Commodore, Qume and RS232, it should be able to link to just about anything.

Farther, at 19 CPIPS, but more expensive at £11,675, is the DTPP 2025, from the same company. Millions of advanced features, including double print, bold print, underlining, plotting up to 160 characters a line, and so on, make this a versatile and fast daisywheel printer. Not many models under £10 grand will print as fast as this one will.

Many-coloured dreams

A company down in Woking is producing a whole range of daisywheel models, including one at just £475. However, the Curtis 10-14 won't win any prizes, as it produces its letter quality output at the jaw-dropping rate of 13 CPIPS. Still, 500 pins print in either red or black, and a large print buffer compensates somewhat for the slow speed by freeing the computer to get on with some more work while everything is being printed out.

The 10-14 comes from Curtis Electronics, Park Farm Road, Woking, Surrey GU20 1DQ, as does the Diablo 820 ROC at £975 and the Diablo 820 API at £1,650. These two are fairly similar, printing at 29 CPIPS and 49 CPIPS respectively, and including various font sizes, character widths, margin controls, and so on. RS232 interface are available on both models, but the latter scores in its graphic abilities, as it incorporates Diablo's Hyperline plotting — useful for all those business programs that churn out charts and histograms at the drop of a hat.

Many other daisywheel printers are available, including the Olympia ES900 ROC, from Intelligent Interfaces, 646 Wood Street, Shrewsbury-on-Avon, Warwickshire CV7 7JQ at £1,126. Smith Corona is another commonly encountered name, and its extremely cheap (£349+ 120 words a minute TPI-1 model) has already found a few friends. This can be obtained from Dicos Trading Company, Dicos House, 10 High Street, Evesham, Worcestershire WR11 8DA.

Finally, at a shade under £4,500, is the Hyperline 101 last a printer with a name, from the same Dicos Trading Company. This normally comes with a Commodore interface, although you can get a Commodore-compatible RS232 interface fitted if desired. Although it has a slow print speed of just 8 to 12 CPIPS, it has one feature which is truly amazing at this price. It is also a typewriter, having a full travelling keyboard fitted to it. Since it only weighs 21 pounds, it also becomes portable rather than unportable.

I've covered a reasonable range of printers, from the surprisingly cheap to the eye-wateringly expensive, with print speeds going from the slowest to the fastest. The rest is up to you.

One final word of warning about going to buy a printer. They are expensive, usually costing more than the computer, so you're entitled to a little bit of extra help from the shop. Demand to see a working version of the setup that you will be using, including all the interfaces and all the software, before parting with your hard-earned cash. Only then will any last-minute problems come to light. ■

Cross the minefield at your own risk

ONE OF THE more commonly recommended ways of learning to program is by studying someone else's programs, and adopting any useful techniques that they might have used. We can follow that procedure by looking at a game program for the correspondingly simple 20.

The game is called Minefield, and the object of the game is to guide a little robot across a 9 by 10 square grid. Some of the squares on the grid have mines in them, and walking into such a square will result in certain destruction!

2000-2001

You are equipped with a noisy radar that allows you to see the immediate area around you. If there is a mine within one square of your present position, this information will be displayed at the top of the screen. However, it's up to you to determine which square the radar is indicating.

Getting successfully across the grid will send you onto the next level where there are even more hidden mines. And so it goes on, with more mines appearing all the time, until the inevitable happens and you are now down.

The program can be broken down into several main chunks, and the first 10 lines just clear the screen, tell you who to blame for the program, set the screen and border colours, and then go into displaying the message along with the correct line dimension on an array `MESSAGELINE[10]`. This array

2007-08-14 10:56

Pete Gerrard shows Vic 20 owners through the minefields of programming

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Line 20 contains the level counter L , and the variable J_1 , which determines your position on the screen relative to the start of the screen memory, which are the

unspaced by, starts at location 7888. Lines 50 to 59 need some explanation as the printer used to produce the listing can't reproduce the graphic symbols. Line 50 consists of PRINTING within quotes a space, then shifted C, then a space, then shifted C, and so on, until you have 9 spaces and 9 shifted C's. Line 51 is exactly the same as line 50.

Line 10 is PRINTING within quotes, a shifted B, a space, a shifted B, a space, and so on, until you have 10 shifted Bs and 10 spaces. This draws the grid for the



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TERMINAL SOFTWARE

commodore 64 games cassettes

SUPER SCRABBLE

Personal Computer News (15-21 Sept '83) gave SUPER SCRABBLE an overall rating of NINETEEN OUT OF TWENTY and described it as "Well implemented with beautifully smooth scrolling and very nice graphics."



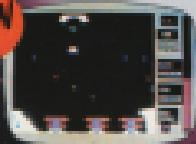
SUPER SCRABBLE!

"An excellent game" said Computer & Video Games magazine (Sept '83).

STELLAR DODGER

A game of skill and anticipation in which you must dodge your way through asteroids to complete your mission.

NEW



TERMINAL



SUPER GRIDDER

"...a compelling piece of levity that could give hours of fun," was the verdict of Personal Computer News (22-23 Sept '83).



SUPER DOGFIGHT

The first 64 games cassette to have SIMULTANEOUS TWO-PLAYER ACTION - realistic sound effects too.

HUNTER

A fast action game in which your pursues gain in speed and intelligence as you master each successive screen.

VIC-20 games cassettes

Pinball Wizard
Scramble
Gridder
Line-Up 4/Reversi

Car Load!
Master Blaster
Terminal Invaders
Log Run

The Curse of the Werewolf
Rescue from Castle Dread
Magic Miner
Nostesaru

PINBALL WIZARD

Experience FAST action and REALISTIC gravity as never before. You can even use the nippes to trap and hold the ball. NUDGE the table too - but not too much or it'll tilt!

TERMINAL



SELECTIVE PROGRAM DOWNLOADS

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Sonic

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Interplay

LASERS

TERMINAL SOFTWARE
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PERSONAL COMPUTER SYSTEMS
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Line 30 positions you on the grid, and places an asterisk in the top right-hand corner of the grid; this is the spot that you're aiming for.

Lines 28 through 39 are generating the positions of the 10^6 sites, or grid, by producing random numbers in the range 0 through 9 for the X dimension, 0 through 9 for the Y dimension, and then casting these X, Y random numbers into our $100|10,100$ array by partitioning a value of 1 into the array where the co-ordinates meet. A 0 in the array means that there is no atom at that location.

Line 68 is a universal check to see if you've reached the top-right-hand corner of the grid. Lines 69 through 80 check for pressing of one of the four movement keys, and going to the REMIND subroutine to process moving up, down, left or right.

All of these moving routines are the same in that they start by checking for the validity of a move (to ensure that you don't go over the borders of the grid). They then update your position on the grid and PLOT your new position onto the screen using the *P* variable offset from the start of screen memory at *7860*. Your old position is indicated by a dot on the screen, positioned using the variable *O*.

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The next step is to update prior X or Y co-ordinates on the grid, before going on to the bonds checking subroutine starting at line 1600. This checks the X and Y co-ordinates of all of the surrounding squares for the presence of a bond by using the original MC(0,1) array and seeing if any of the surrounding X , Y co-ordinate squares contain a 1, or in other words a bond.

Line 1002 checks the set if you're on a square with a benthic in it. If you are it's off to line 1003 and a message that tells you you're dead, before showing the offending benthic's position on the grid.

If you managed to reach the corner of the grid, the routine starting at line 5800 informs you of your success, updates the level counter L just that we can have more bonuses, and then renews all the board locations to 0, before going back to line 200 and continuing with some extra bonuses.

The main things to look at in the listing are the way that the grid is handled and the way that the surrounding squares are checked for the presence of a bomb. The use of the array `MIN[10][10]` to hold the bomb information and the use of the `X` and `Y` coordinate is provides most of the lessons in this short program.

Other things to note are generating random numbers (line 27), checking that the board is not placed in either the starting square, one of the squares next to it or in which case you could never start the game, and the end square, all of which is done in line 28, and the handling of key pressing in lines 34 to 39. You should also have a function to draw the board.

This is a special Vic 20 adaptation of the original Minefield game. For the Commodore 64, as published in *Using the 64*, author Peter Gervais, publisher: Gervais Books.

THE BEST 64 SOFTWARE

We offer the best software for the Commodore 64. Much of it comes from our own programmers, but we also market the best software we can find from other software companies. So if you want the best, take a look at our catalogue.

BUSINESS SOFTWARE

In our opinion the 64 is one of the most powerful business machines around. Don't be fooled by the price — just make the most of it! If you want a spreadsheet program that's powerful, but easy to use, try BUSINESSC 2. A £99 plus VAT on tape or £111 plus VAT on disk it is much cheaper than comparable programs — and so easy to learn that you'll hardly need to use the excellent manual.

For your word processing needs we recommend VIGARWHITE. We can now offer VIGARWHITE in a cartridge at £99.95 including VAT (choose tape or tape or disk) or for disk users only we can offer VIGARWHITE and VIGARMAIL, on one disk for just £99.95 including VAT.

PROGRAMMING AIDS

If you can't afford a disk unit — but find tape loading tedious, you need the ARROW cartridge which will LOAD or SAVE programs at 7 to 8 times normal speed (programs must first be SAVED using ARROW). A bargain at £29 plus VAT.

The VICTREE cartridge has over 40 programming aid commands (including a REMEMBER that works, advanced INPUT commands, and BASIC 4 disk commands) all in a very low price of £49 plus VAT. Machine code programmers will probably be more interested in our 200096 super monitor (£79 plus VAT on tape) or our MICROASSEMBLER cartridge, an easy-to-use full-featured assembler plus monitor for C64 plus VAT.

ARCADE & FANTASY GAMES

We stock some of the best games around. We reckon BIKK is the best arcade game for the 64, but our CRAZY BIKK can't be beat. Want to disagree? With a recent review about BIKK, US — the graphics are very original, but if you want something really different try 3D-GLOOPEL, a sort of three-dimensional Pong-like game. All these machine code arcade games cost £3.95 including VAT. At the same price you might prefer our fantasy game with sprite graphics, HALLS OF DEATH.

SUPERSOFT

AMAZING 80-COLUMN BOARD!

We have two new boards to upgrade 40-column PETs to 80 columns — one is for small screen machines, the other for the T40-407. So now the only machines that can't have 80 columns are the very dinky calculation style machines with built-in cassette deck.

Either board costs just £125, but you must know which machine you have at the time of ordering. Your computer must have BASIC 4.0 or be upgraded to BASIC 4.0 (the later can save costs £10). If you need to be able to switch between 40 and 80 columns we can handle that too — for £10 you can buy an extra board that allows you to switch instantly without even opening the computer!

8032 BECOMES 8096

Our 64k expansion board for the 8032 turns it into an 8096 — yet it's less than half the size of the Commodore board! We're using the latest 64k dynamic RAMs (as fitted in the 200 series) but they're utilising 164 chips, hence the difference.

The 8096 board costs £250. Anyone can fit it in a machine — no modifications to the computer are required. If you already have VIGACALC we can upgrade it to the new version for just £10 (you could have 256k of data storage!).

WORD PROCESSOR OFFER

Few people would dispute that MICROSCRIPT is the best word processor for the 8032 and 8096 — but it appeared too late to make much impact on the UK market. To make up for lost time we're going to make you an offer that you can't refuse.

Buy MICROSCRIPT before December 31st and get free either a second copy of MICROSCRIPT, a 64k memory expansion, an 80 column cartridge, or £25 worth of games software from our catalogue. MICROSCRIPT is not just a disk, it has its own plug-in based with lots of ROM and lots of RAM — how about that for value!

IF YOU DON'T HAVE OUR PET/C64 CATALOGUE PHONE NOW FOR YOUR FREE COPY
POSTAGE FREE, (BUT ADD 15% VAT)

SUPERSOFT

Winchester House, Canning Road, Westcliff-on-Sea,
Harrow, Middlesex, HA3 7SD
Telephone 01-881 1186

Lee Allen's *Bomber Run* turns you and your craft loose in the 'wild blue yonder'

GO INTO SPACE ON YOUR 64

BOMBER RUN for the Commodore 64 utilizes high-resolution graphics to construct a random cityscape and enables you to control the plane, bombs and clouds. The program gives the following options: joystick port 21 or keyboard, skill level 11-21, and plane speed fast-slow.

As the plane flies back and forth across the sky your bombs must destroy the city below or enable the plane to land, re-fuel and embark on another mission. After each successful landing your original flight path is restored and, when applicable, your skill level is automatically increased.

A score table routine is provided which lists the top 10 names against their scores. During this sequence the following options are available: fire button/space bar — resume to game, F1 — change skill level, and F7 — quit game.

The program should be saved prior to running as pressing F7 activates no-resume mode (CATS 64/64). The program also self-runs after 20 seconds.

The REM statements included in the program listing should be helpful pointers in understanding how the program functions. Due to the lowering of memory that takes place during the program only 133 bytes remain free. Therefore, they should be ignored during programming. Here is a brief listing:

Please note that standard abbreviations for Basic keywords must be used in order to satisfy some line lengths. These appear on pages 101 and 102 in the user manual.

Here are some further notes: the data file is read but not used for sprite generation. The pointer for generated memory in memory start/256, is P00E 52, 12338/1354. The x-co-ordinate of sprite(n) is controlled thus:

10 for n = 0 to 343
20 poke VC = 1.0 and 2.5
30 poke VC = 3.0
40 poke VC = 16.0 and 256*4
50 poke VC = 21.0
60 next

(This is a revised version of a program previously published in *Popular Computing Weekly*.)

```

10 REM BOMBER RUN FOR COMMODORE 64 BY LEE ALLEN
20 REM
30 REM THIS PROGRAM IS A BASIC PROGRAM WHICH USES
40 REM THE COMMODORE 64'S HIGH RESOLUTION GRAPHICS
50 REM TO DRAW A RANDOM CITYSCAPE. THE PROGRAM
60 REM ALLOWS YOU TO CONTROL THE PLANE, BOMBS AND CLOUDS.
70 REM
80 REM THE PLANE IS CONTROLLED BY THE KEYBOARD OR
90 REM THE COMMODORE 64'S JOYSTICK. THE BOMBS ARE
100 REM CONTROLLED BY THE FIRE BUTTON OR THE SPACE BAR.
110 REM THE CLOUDS ARE CONTROLLED BY THE LEFT AND
120 REM RIGHT ARROW KEYS.
130 REM
140 REM THE PROGRAM ALSO FEATURES A HIGH SCORE TABLE
150 REM WHICH DISPLAYS THE TOP 10 HIGH SCORES.
160 REM
170 REM ENJOY!
180 REM
190 REM LEE ALLEN
200 REM
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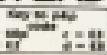
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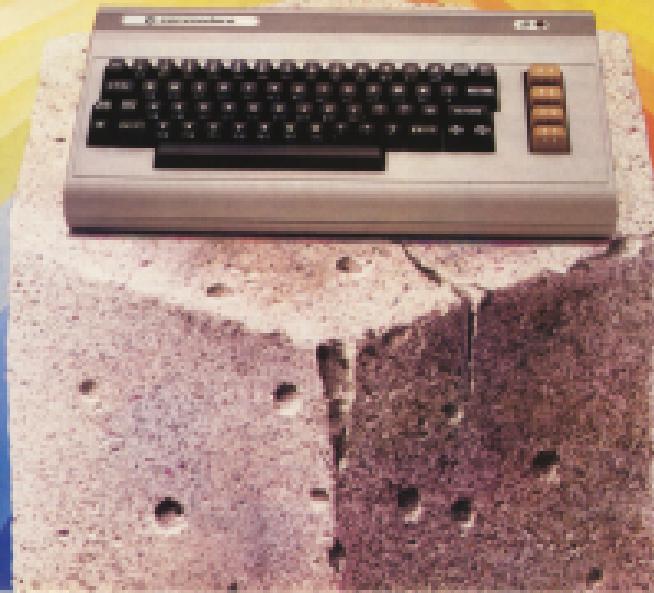
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The department which has designs on you

Graham Cunningham talks to Gail Wellington — the lady leading Commodore's software charge

"**SOFTWARE SELLS hardware**" is a common enough cry these days. But just six months ago Commodore president Jack Tramiel admitted: "In the past, our emphasis was on computer hardware." He put Sig Hartman in charge of developing software in the US and added: "Today our philosophy has changed." But the UK was already ahead of the States.

Two months earlier Gail Wellington had taken over as software products manager in Slough. As she says: "When I took over software was a small department, now there's 12 people here with more than 80 machines." And that department has designs on you.

In the run-up to Christmas Commodore is launching a range of packages covering games, business and education. Easy File, Fun Maths and Assembler Tutor will be out for the 64, backed up by the second part of Introduction to Basic, which has already sold well on the Vic. Other business packages include Easy Stock and Future Finance. Games add-ons can include in Fact Aids, Maggot Mania and Dancing Monsters, while Ski, Trap and Space Snooki, among others, are headed the way of Vic users.

None of this software is written in-house. As Gail says: "We'll look at anything anybody wants to send us." In fact Maggot Mania arrived through the post from 16-year-old Jason Perkins. Commodore suggested a few improvements, Jason incorporated the revisions and the finished version is now on sale. Programs can arrive other ways. For example, Gail first met graphic designer Paul Jay through the users' group KCPUG. Paul Auster is a result of that meeting.

Assembler Tutor comes from Owen Mancom, an industrial training consultant, and Gail promises that this will be the one to ease the frustrations of Basic users prepared by machine code. As she says: "A lot more people are becoming interested in machine code, partly to write better games and partly to understand more about the computer." Assembler Tutor aims to turn this interest into achievement, incorporating a question and answer format.

Sometimes two heads can be better than one when it comes to programming — and

among Commodore's software authors these two heads tend to belong to fathers and their sons. Space Snooki was written by John Cullen, whose father is the man behind Introduction to Basic, while Future Finance comes from Finamax, a father and son team in Northern Ireland.

Finamax supports a philosophy close to Commodore's heart. Gail backs her president's aim of producing software for the masses — not for the classes. She explains that Finamax was "inspired to do this when we brought the cost of software down — because it would make it available to more people". Gail wants to produce software that will appeal to a broad range of users — it should all be easy and fun to use, even if it's for the education or business markets. However, in case Jack Tramiel's ability to turn a good quote should mislead, she adds: "Of course, we'll still produce specialist software for particular applications."

Being boss

Gail thinks that Commodore's president is "an amazing person". He is the driving force behind the firm with "terrific sales instincts for the market". She adds: "We see him at least every two or three months" — but you hear from him a lot more often. Jack Tramiel pursues a management policy of "kick 'em in the 'tits". If he thinks you're doing well, you'll get the praise — equally if you're not doing what he expects, you'll hear about it.

And what the president expects is more software. "We intend to be a major force in the software business," he said earlier this year, and Gail is backing him all the way. She supports his aggressive approach, thinking that "it's not an unreasonable way to run a business", and adds some touches of her own. On her desk sits a card bearing the tongue-twisting message: "If at first you don't succeed, you're fired."

What this approach means for Commodore users is that a batch of new languages and adventures are on their way. More Scott Adams adventures will be available on the Vic, and some titles will be introduced on the 64. Users of both machines will also have a chance to play The Quest — a UK-produced lunchtime



Gail Wellington, Commodore's UK software products manager, already has favourites at Commodore. If you've got a 64 the choice will be even wider. Another UK game, Medusa's Lair, is on its way along with some celebrated American titles from Infocom, including Suspended, Deadline and the Zork trilogy. Strategy fans can look forward to a series of simulations starting with High Flyer (not Headway this time), but a big-time business operator, Rail Boss and Ocean Racer — all for the 64.

As for languages, "the best implementation of Logo on any micro-computer" will be followed by a UK implementation of UCSD Pascal, Cmal, Fortran, Prolog, Pascal and a version of Cobol. As the list suggests Commodore has



Manager — smiling in terms of "in in England and then over there"

Its eye on the education market, Gill likes "selling things that have educational value" and thinks that the speech module due next year for the 64 is "ideal for primary schools". A version for Vic users will follow later in the year, while talking books and programs are also on their way.

Users of the 64 have more to look forward to — gaining access to CP/M-based software. A Z80 card allowing this will "probably be available before Christmas". The card is also needed to run the Colour implementation. For 100 users the charge will be even wider: a CP/M-80 card has been finalised and MUDOS is being tested now. Specialised software on rival operating systems can then be used on

Commodore micros, although Gill adds that "native operating system software will still run fast".

There are no plans for a second processor option on the Vic, and CP/M-80 and MUDOS will not be implemented on the 64 because its CPU is fundamentally different to the PDP's. However, all users will be getting Commodore's software answer to Apple's Lisa. The price of Magic Disk has not been decided yet, but Gill says "it will be in the range of all our other software". And the more expensive package she sells for the 64 costs £75.

Like Lisa, Magic Disk provides pictures on the screen (scaled icons identifying different items on the menu). So by selecting

the typewriter icon you get word processing, the telephone gives you networking, the filing cabinet gives you the database, whatever you can guess ... and so on. As with most of Commodore's software the package is aimed at the "average consumer" although Gill thinks small business would also find Magic Disk worth considering. The icons have already been designed and the software to drive them "is in advanced stages of development".

Obviously things have changed since software was only a background activity at Commodore. Gill is pleased with the results so far and "particularly pleased that the UK is contributing so much". Ironically, though, she voice that declares "I'm proud to be a part of the UK's success" has an American accent — a fact that surprises a lot of people when she visits Commodore in the States. However, all but the accent has been assimilated. She now thinks in terms of "us in England and them over there" and likes "great delight in going back to America and representing the UK software industry".

Gringe

So how did you get Gill to represent you? The answer is to do as Jason Pertwin did — send your tape or disk to Commodore in Slough. And don't worry about the quality of your coding, it's what your program achieves that's important. As Gill says: "We publish programs that would make teachers cringe — if the graphics are good, the quality of the coding doesn't matter." Commodore is sent more than 100 programs a month and accepts only about 5%. But every writer gets an evaluation that back with a detailed opinion of his submission. There's no need to send a printout, but don't forget to send instructions on how to use your program.

It is the successful 5% that are partly responsible for Commodore UK's software growth. The company operates worldwide — I wouldn't like to pay our international phone bill! — but Commodore has the UK plays an important role in software development. In fact this month the UK is playing host to an international meeting of Commodore software managers to plan next year's strategy. The message is that "the UK is small but our software contribution is large".

Then the UK will take much of the software developed in the UK, although there are differences in taste. Carrigans, particularly of "class-on-up" games, are preferred in the States. Gill adds that there's more interest in games of strategy over here, but in best diplomatic manner, she says more about the difference in national psyche this suggests.

"Class-on-up" is a strategy, Commodore is in the software business for real now — how far will it go? Royal micro manufacturer Atari is already transporting its games to run on Commodore machines, raising speculation that Commodore might do the same in reverse. "There's always a chance we'll do anything," Gill says, "but we've no immediate plans on this". As she adds: "My plate's full at the moment." ■

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This is it, the ultimate Fruit Machine for the VIC with coins, hold and triple 100% machine code. "Overall Jackpot is a beautifully written simulation giving superb graphics, animation and use of colour. In fact, this program makes Commodore's Fruit Machine cartridge look embarrassingly cheap and nasty." Home Computing Weekly No. 30 04/7/88. £19.99

SWAZY SWARS

Accuracy and speed are required for this Shooting Gallery, superb use of colour and graphics in this new and challenging game from the author of Jackpot. 100% machine code, joystick or keyboard control. £19.99

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Choose your own game from the following options — difficulty 1-5, speed 1-3, size of maze 1-3, visibility or invisible maze, still or moving power pills, define your own key controls, any combination, if this is your type of game, then this is the one for you, for the VIC expand. VIC only. £19.99

COMMODORE 64 GAMES AND UTILITIES

JACKPOT 64

At last it's here, specially written for the 64, by the author of "JACKPOT" the ultimate Fruit Machine program for the VIC. £19.99

WESTMINSTER

A game for up to four players, can you lead the party of your choice and win the general election, use the 60 combat vehicles (600) buying votes, when you can (but like the real things), this must be one of the first board type games specifically written for the computer. Who play on your own, have fun with your family and friends playing WESTMINSTER. £19.99

ROB ALERT

A game for 1-4 players, with sound and graphics. Make money in casinos, command robbery, hide from the police, hire secret agents (some of whom can be parachuted), negotiate for weapons, find and attack the secret rocket base to launch the missile, and watch the havoc and destruction caused. There is no running back from "ROB ALERT". £19.99

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A game for two to twenty players, become a part of the motor trade, you must obtain franchises, try and negotiate to produce cars for sale. Form syndicates, buy and exchange parts, buy dealerships, but be careful, you may become bankrupt and have to liquidate, find out what you are made of, have you got what it takes to become a WHITELINE DEALER. £19.99



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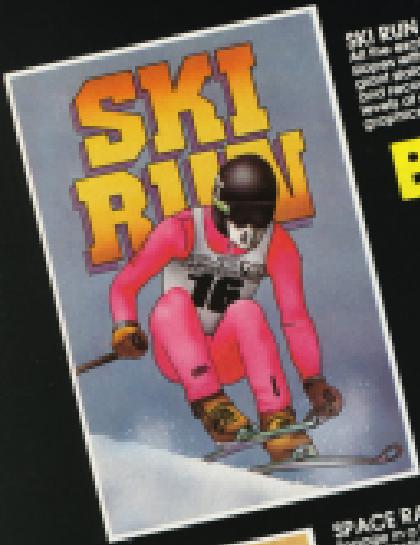
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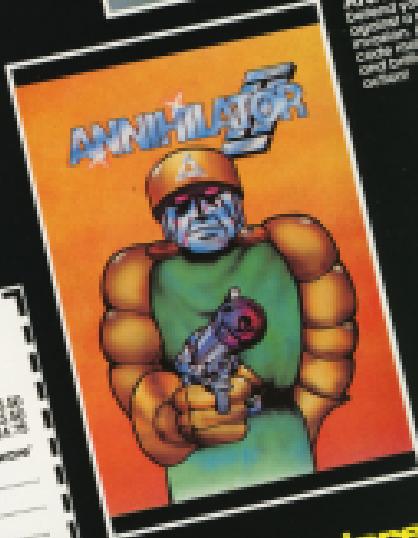
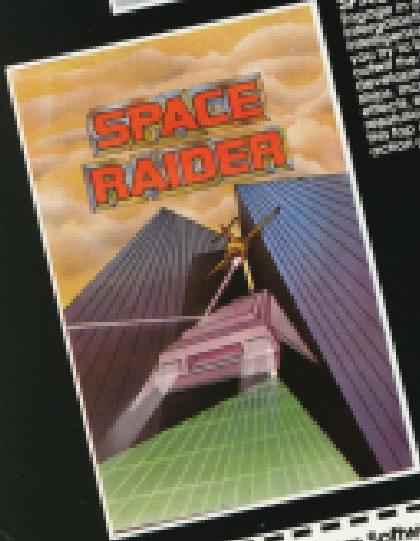
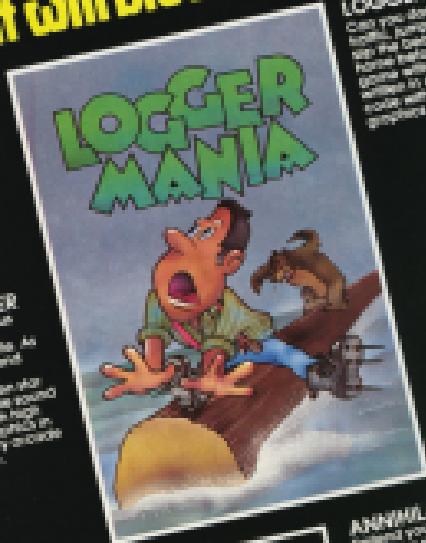
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commodore 64
and VIC 20

Design your own business program

THE FIRST QUESTION you have to ask yourself is whether a computer system would be beneficial to your business. On completion of my accounts system, I continued with the manual version for some months as a comparison. The first, most obvious fact to emerge was the saving in time. My manual file was a month even reduced by the computer to half a day, with a trivial deal more information than I had time to compile by the long-hand method. I had often heard people say "the computer is wrong again" so I was naturally wary of my results, sending to double the computer's. If they differed to my "superior" long-hand methods. After being proved wrong on many occasions, I have now come to the conclusion that computers are far more suited to producing accurate accounts, respectively.

Your own system?

The second question you have to ask is whether the time spent on designing and writing your own system is justified. If you require a system specific to your needs then the answer is Yes, otherwise you may have to change your system to suit a commercially produced package. There are other advantages in writing your own system, such as understanding the programs in operation and being in a position to sort out problems which may be encountered. If you find you cannot spare the time required then you could consider employing someone to do it for you. There are numerous amateur programmers around who would be more than willing to put their knowledge to an applied task. Be prepared, however, to spend some time with your programmer as it is unlikely that you will convey sufficient information to him/her the first time round.

What you'll need

Initially the purchase of a Commodore 64 and the Commodore cassette recorder for storing programs and information would be adequate for a large number of business applications, and a printer and/or a disk drive would follow if required. Obviously certain programs, such as word processing, would need a printer or at least access to one, and there are firms who will undertake to print your script. Therefore, bearing in mind those who will purchase a set and cassette recorder initially, the programs listed here will produce the necessary information on the screen. But provisions have been made for each program to be expanded to include printer and disk drive facilities at a later date if required.

The introduction of a computer system is

PROGRAMMING

An extract from Jim Heff's forthcoming book "Business Applications on the 64"

likely to enhance any business — consider that by entering into the computer each transaction, or a condensed coded version, once only, you will obtain a great deal of information at the end of the day, for example:

- Information to produce invoices and statements.
- A breakdown of customer accounts.
- Complete information on all transactions to date, identifying VAT (for instance, and also taking into account value of stock held, outstanding accounts and orders, and even your credit limit).
- Stock levels, updated in conjunction with customer accounts or direct sales and information on which items of stock should be re-ordered to bring the levels above a certain minimum.
- Analysis of stock movement over a specified period, facilitating planning and leading to a business being run more efficiently and economically.

In fact, any information you require is instantly available, being up-to-date and in any format you could wish at the touch of a button.

A good impression

Consider the impression you would make on your bank manager if he saw one day, concerned about your overdraft, and you were able to present him with an up-to-the-minute financial state of your business, contained in a typed report, printed that same day.

There are many books on computing, but they tend to stick to the raw facts with little imagination as to application in everyday business. With this in mind, my intention is to produce working programs in such a way that lack of programming experience is not a serious disadvantage. The programs listed can be used as they are, I have attempted to write them in as plain and logical a manner as possible. This means that some steps are more long-winded than needs be, but from my own experience, I feel it is essential to produce working programs first and then to nothing to hinder you from modifying the programs as a later date as your knowledge increases. I would be disappointed if I thought this work did not stimulate the reader into modifying the listings to suit his/her own

application — the only limitation is your own imagination.

Now down to some subtleties, which will be of use in most business applications. (SPC) indicates upper case space or shift key/space and it is important that this is addressed to. The blank or spaces appearing in the program should be included using the space bar key only. Subsequent 1 deals with allocating strings, setting up strings, program security, disk access channel, and checking for printer presence. The first five lines, although obviously not part of the subroutine, explain the codes used in the program for control characters in place of graphic symbols. Graphic symbols can only be achieved by dot matrix or thermal printers and not impact printers. Note that neither the square brackets nor the code contained within should be included in a program, but the relevant control character inserted instead.

Setting the colors

In line 2 the two initial poke commands and chck(14) set the screen and border colors in two shades of grey with black letters which gives reasonable contrast on a black and white TV set. Chck(14) puts the computer into lower case mode (chr(94) = upper case mode and alternatives to these are pok(50172,23 and pok(5172,23 respectively). It is worth noting at this point the number 128, is the difference between 14 and 142. This number added to or subtracted from character string codes will produce the opposite effect, i.e. chr(829) cursor right and chck(14) cursor left, the difference being 128. The last poke 213 enables all the keys to repeat with continuous pressure on a key.

In line 3 the ch=1 variable is set to avoid the unnecessary routine lines 14-26 when returning from the program screen time round. Close(11), along with open(15,15) in line 8, engages the disk access channel but should be omitted in tape systems. The strings w1 and w2 in lines 4-5 will give a simple window/border effect when printed. This changes the ends of the operation to a question and aids concatenation. The addition of the program name is a constant reminder of the program running. By printing with the screen is cleared of all information and is useful in programming.

Padding out strings

Lines 6-9 set up the variable b61 with 60 shift/space and are used for padding out strings. Line 10 allocates space in memory for subscribed arrays, but the numbers can be altered to suit a particular program. Line 11 is needed if a computer is being used. ■

Windows 1.0 allows drivers, set up programs, handles program security and also in the printer program. While compiled programs, to enable to use the run/setup key, specific commands are necessary and are detailed in the controller manual.

Line 13-20 deal with program security and require a known code (0001-100000) to be present before the program can be run.

Lines 23-24 are a routine for reading a character at a time from the keyboard, then creating the variable *key*, and they act as an alternative to the INPUT command. **INPUT** is a simple way of obtaining information, but offers no control over the characters typed in. If a comment or code is part of the input, any information after these characters will be ignored. To place a point in this simple program:

⑩ Input “Type is Information” (all points, 2 points)

Type in **available** or **available and on** **existing return**, only the three as will be

message ? EXTRA
in the screen. This
is not a bug, just
press the space
key three times and
it will be — the
space bar is not
shifted space. This rule also
applies to information obtained by the GET
statement. Line 12 operates by searching
the keyboard buffer to see whether a key
has been pressed and, if not, loops back to
the beginning of line 22.

Obviously this security system, as it stands, is limited, as anyone with program experience could easily find the code by listing the program or bypassing it using `BLT$` and `BLT#` by-passing the code input. One method of improving the system would be to make the code self-initialise when the program was listed and this can be done quite simply by changing line 28 as follows:

To include the 16 deleted type points followed by moving the cursor back one place, hold down the shift key and press the control key 26 times. Release shift key.

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4) and press inst/del key 26 times. On leaving the program, line 21 will read print "0", in other words the important code word (slot) has disappeared.

Plugged in

Lines 27-32 make up a routine which, basically, is asking whether a printer will be used in the program operation and if it is, will check whether the printer is plugged in or not. Various results are obtained and it is a matter of experimentation to establish the correct routine to suit. Factors affecting the results are whether the printer is plugged directly into a computer or plugged into the back of the disk drives. In line 31 command open4,4 refers to open a channel at line 4 to device number 4. Device number 4 is the code which the computer recognises as a "printer has to be necessary". BT or status line provides a record of the status of the system after a peripheral such as a tape module or printer has been accounted. If all systems are ok, the variable \$0 is returned as zero. The \$18 is the code for DEVICE NOT PRESENT and although a return of this error number should be interpreted, it can happen that the running program will stop and will have to be restarted from scratch. There is obviously little point in running a program dealing with complicated data analysis only to have the program end because the printer has not been plugged in. Far better to establish this point at the very beginning.

Line 9999 will end the program and close the disk error channel. CLOSE 11 will close

all other disk channels and should be omitted in a tape system.

Subroutine 2 is a simple routine dealing with common questions which are frequently referred to and can save valuable memory space and programming time. Lines 200-206 can be accessed either at line 200 or 202 depending on the type of question to be asked, eg. the operator has been requested to enter a data file name and goes to 200 because the operator checks the entry before continuing. Goto 202 would be referred to for a straight YES or NO answer to a question such as DO YOU "WISH TO PROCEE DT press K02". Line 205 will not accept keyboard entries unless they are either y or n. Line 206 clears the screen, places the program name at the top and returns to the point after access.

Program pause

Lines 208-215 provide a halt in the running program to enable the operator to place a tape in the recorder or paper in the printer. Line 204 will only accept a SPACE BAR entry to continue. Numerous programs request PRESS ANY KEY to continue and this is not advisable. A colleague of mine included this statement randomly in his program and one day, during a demonstration of a program to a captive audience, the RUP/RTCP key was entered and caused him some embarrassment. It is, therefore, advisable to always specify a key entry. The space bar is ideal in that it is at the bottom of the keyboard, is large and easily found by the operator. This is an example of making a

program interactive with the operator just as good screen display is important too.

Lines 216-223 deal with the automatic loading and running of a MEMLU program by requesting whether this is intended and if the answer is NO the command RUN is operated. Use of RUN in programs will probably be frowned upon by many programmers who will claim "sloppy programming technique". They are, of course, correct, but it's use is also very convenient in that all variables and arrays are cleared from memory and the program is restarted as if it had just been loaded. By specifying RUN, the variable \$1 is set to one and the code entry sequence is bypassed.

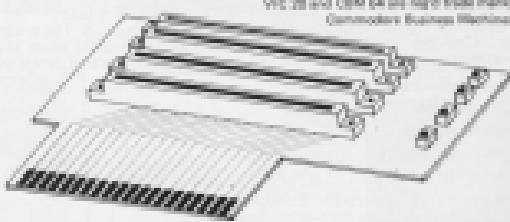
Lines 224-229 deal with the mechanics of loading and running the menu program. CLR clears all variables from memory, the screen is cleared and load "menu" is printed on the screen followed by a free line and run is printed onto the screen. Note the sequence to print quotation marks at menu, in the use of CLR/24. The positive sign can be used instead of a quotation to allow the line to be printed to the screen in sequence.

The effect created by the poles in line 201 is identical to typing load "menu" on the screen, pressing the return key, followed by run and return key as in direct mode. It is possible to use the load command in the program mode, in 3000 load "menu". However, problems can arise from this as the size of the program to be loaded is in fact larger than the original program. ■

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COMMODORE SOFTWARE FILE

Moles

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points on paper when you are done.

splattered, and the sound of a squelch is emitted. You will score 10 points for each you hit, resulting a maximum of 150 points. If you miss, however, a short buzz sound, sort like, and you score nothing.

When you run out of bombs, a short message appears, and the program restarts itself. If you run out of time, the timer beeps, and you restart.

```

4100 DASHBORD101420 ,4440 ,4600
4200 PORT1=1601,PORT2=1602,PORT3=1603
4210 PORT4=1700,PORT5=1701
4220 LEFT=1601,PORT6=1606
4230 PORT7=1607,PORT8=1608
4240 LEFT=1609,PORT9=1609
4250 PORT10=1610,PORT11=1611
4260 PORT12=1612,PORT13=1613
4270 PORT14=1614,PORT15=1615
4280 PORT16=1616,PORT17=1617
4290 PORT18=1618,PORT19=1619
4300 PORT20=1620,PORT21=1621,PORT22=1622
4310 PORT23=1623,PORT24=1624,PORT25=1625
4320 PORT26=1626,PORT27=1627,PORT28=1628
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```

The variables are as follows:

m = Position of Index

0 = 0.001

NP = Number of protein references

H = Number of nodes having a child

— www.ams.org

5. **Read**

6. Reasons to be concerned (cont.)

10

REFERENCES

Editorial

ANSWER

Continued on page 12


```

1870 PRINT" 00 0 0 0000000000 00 00 00 0"
1880 PRINT" 0000000000 0000000000 0000000000"
1890 PRINT" 0000000000 0000000000 0000000000"
1900 PRINT" 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
1910 FOR I=1804 TO 1944 STEP 40: POKE I, 8: POKE I+CD, 6: NEXT
1920 FOR I=1943 TO 1963 STEP 40: POKE I, 8: POKE I+CD, 6: NEXT
1930 FOR I=1964 TO 1983: POKE I, 8: POKE I+CD, 6: NEXT
1940 POKE 8, RF=8: SC=8: HI=1928: LI=8
1950 RETURN

```

Light Sound

From Richard Barlow in Dagenham — for the Vic 20 with Super Expander. THIS PROGRAM generates music in basic parts and full colour graphics in grids, circles, triangles, etc. The choice of graphics

is dependent upon the musical notes chosen and they are overlaid one upon the other in different colours.

The program is for the Vic 20 plus Super Expander.

```

10 REM LIGHT & SOUND
12 REM R. BARLOW, 1983
14 GRAPHIC2
20 SC=36874: S2=36875: S3=36876:
  S4=36877: V=36878
30 POKE V, 5
50 FOR RP=1 TO 8
60 CD=INT(RND(1)*15)
70 COLORCD, 2, 8, CD, 8
80 A=INT(RND(1)*127)+50
90 B=INT(RND(1)*127)+125
100 C=INT(RND(1)*127)+125
110 D=INT(RND(1)*127)+125
120 TD=INT(RND(1)*2000)+1
130 E=INT(RND(1)*1820)
140 F=INT(RND(1)*1820)
150 G=INT(RND(1)*1820)
160 H=INT(RND(1)*1820)
170 POKE S2, H
180 DRPAE, E, FT00, HT0500, 18237DE, F
190 FORT=1 TO TD: NEXTT
200 POKE S2, B
210 POKE S1, C
220 FORT=1 TO TD: NEXTT
230 IFTDCRTHENPOKE S4, B
240 IFDCRTHEN: CIRCLE2, E, F, G, H
250 IFDCRTHEN: CIRCLE2, E, F, G, H

```

```

260 IFTDCRTHEN: CIRCLE2, E, F, G, H
270 IFTDCRTHEN: CIRCLE2, E, F, G, H
280 IFTDCRTHEN: CIRCLE2, E, F, G, H
290 FORT=1 TO TD: NEXTT
300 POKE S4, 0: HEXTRP
310 SCHELR
320 GOTO500
330 FORSR=1801 TO 1820 STEP 50
340 DRPAE, G, DT01823, DR
350 HEXTOR
360 RETURN
370 FORSR=1801 TO 1820 STEP 50
380 DRPAE, G, DT001, 1823
390 HEXTOR
400 RETURN
410 FORSR=180500 STEP 50
420 CIRCLEOVER2, 500, 500, CR, CR
430 HEXTOR
440 POKE S1, 0: POKE S2, 0: POKE S3, 0: POKE S4, 0
450 RETURN
460 RD=INT(RND(1)*1000)
470 IFRD<500 THEN: FORSR=RD TO 500 STEP 20
480 IFRD>500 THEN: FORSR=RD TO 500 STEP -20
490 DRPAECD2, 500, 500, DT001, DR
500 HEXTOR
510 RETURN

```

Creating 3D graphics

For the Super Expander Vic — from Mark Stacker, London SW17. ALTHOUGH SMALL this program creates a 3D pattern on the Vic 20 high resolution screen.

—MARC—@ INCLAIR

```

3 GRAPHIC2: COLOR6, 6, 1, 1: FORR=8 TO 420 STEP 1
3 B=SIN((R/50)*100): CIRCLE2, 512, B+500, R,
A: NEXT
1 END

```

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The first few stages in constructing Autiles and microspine may be inexpensive but not without the occasional stumbling block.

Dr John B. Bunting explores

STEPPER MOTORS are a favorite choice for obtaining motor output. Their drives require only logic signals, with no need for digital-to-analog conversion. Until recently only precision "upper-class" motors were available at an inexpensive price, but with the microcomputer and a requirement for low-cost peripherals there has come a demand for cheap stepper motors which the industry has been swift to fulfill. A suitable motor for Autiles and microspine is the Philips PMD-T, distributed by Images of Richmond at around £2.50.

Despite their apparent advantages, stepper motors are not without their problems. They have a firm restriction on their top speed, and the useful torque falls off dramatically as this is approached. Stepper speed changes, even at relatively low speeds, can stall the motor. Unfortunately, unless special drivers are added, the computer is unaware that the motor has slipped "out of sync". All subsequent movements therefore take place with a position error, until a reset maneuver is made. Another drawback in a battery-driven system is power consumption: even when stationary a stepper draws as much power as under full load.

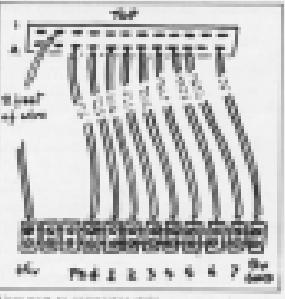
Down to work

But how does a stepper motor work? The rotor is a permanent magnet, while the stator (the fixed case) has a number of electrical windings which when energized create a magnetic field. The field pulls the rotor into line, and by changing the selection of energized windings in a suitable sequence, the rotor is pulled round step by step. When the stepping stops, the rotor is held in position by the magnetic field.

The movement of the permanent-magnet rotor can be likened to the rotation of a magnetic compass — indeed you can use a compass as an experiment to demonstrate how a stepper motor operates. Obtain a cheap compass — the simple sort with a pointer rather than an ornate card will be best. Wind a coil of 50 turns of fine enamelled copper wire — 28swg or finer — across the compass — obviously the wire must not obscure the view of the needle. Connect a 10 ohm resistor in series with the coil, and apply 5v across the ends. You will

find experimenting much easier if you connect the user port to a "bipolar/dual" terminal strip, as shown in Figure 2. You can now find 5v to ground on the connector strip.

When the voltage is applied, the needle should rotate and stop up almost perpendicular to the coil, in along the axis of the coil. Reverse the applied voltage, and the needle will reverse. Unwind the coil, and hence the needle, will be driven directly from two pins of the user port! Unfortunately the current available from PMD-T is limited to about three milliamps, and unless you are prepared to wind coils of several hundred turns this will not eliminate the effect on the needle of the earth's magnetic field. We must therefore use some amplification — no bad thing in preparing to drive genuine stepper motors. The simplest amplifier consists of just one resistor and one transistor per bit of output — four of each per motor. (Later on we can consider using a Darlington driver chip instead.) A good



Use port to connect strip

general purpose PNP transistor is a 2N3703 (BS204-104), costing well under £1.00 per pack of five.

First connect just one transistor to port 001, driving it from PMD via a 1 kohm resistor as shown in Figure 3. Connect the circuit and switch on. Nothing should happen to the compass at first. Set the output driver register to all-high/high by typing POKE 58017,253. Then configure bit 0-1 as outputs by typing POKE 58018,15. Still nothing should happen, because the output of PMD is high, and does not yet sink any current via the transistor base. Now type POKE 58017,251. This will sink PMD to zero and current will flow into PMD from +5v through the transistor and R1. The transistor will be turned on, applying 5v from the transistor collector to the coil and needle. The needle should snap into action. Turn the current off again with POKE 58017,255 before the resistor R1 starts cooking.

To reverse the needle, we must be able to pass current in the opposite direction. With a circuit as simple as this one, we cannot reverse the current in the wire, and so we need a second coil, wound directly over the top of the first. Wind a further 50 turns of wire, connecting one end to the resistor, and winding in a direction such that the two joined wires become the half-way point of the coil which also has 100 turns. Connect a pair of the transistor circuitry, and drive it from PMD, as in Figure 4.

Measy

Now the commands POKE 58017,251-2 followed by POKE 58017,251-1 should drive the compass needle first one way north, and then the other south. Another command POKE 58017,251, will switch off both arms of the coil, and the compass will be left to the measy of the earth's field.

So far, moving about with a compass does not seem to have much to do with robots. But now, the plot gets more exciting. Wind another fine coil, also of 50+50 turns, over and perpendicular to the first coil. Now when the new coil is connected via two more transistors and driven from PMD via PMD, the command POKE 58017,251-4 will cause the needle to point in the new direction. If the first coil caused the needle to point north of south, then the second coil causes the needle to point east or west. By switching on one of the N-S coils and one of the E-W coils together we can also obtain NE, SE, SW and NW (see Figure 5).

Speed and acceleration control
Enter and run the following program:

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1000 POKE 58017,253
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197. *Concordia* reported still multiple areas of the major coastal embankments to
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199. to be.

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that has been. It goes with what is now known as the "new" or "modern" school.

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DISPLAY AD INDEX

ANSWER BACK

Looking for a good book

COULD YOU please tell me whether it is possible to obtain a book about high-resolution graphics on the unexpanded or expanded VIC 20?

Also could you tell me if there is a book about machine code available and, if so, from where.

A. Grimshaw

Blackwood upon Tees
M6 1QZ
probably know there is a great range of books available covering most aspects of the VIC 20. Many of these, however, are hardly worth looking at, especially most of the game books.

For a start on programming in high-resolution graphics it is probably best to try and work your way through the Commodore VIC 20 'Programmers' Reference Manual'.

When it comes to machine code programming the best book is probably 'Watson's Beginning Assembly Language Programming' on the VIC 20.

Calling Micronet

I WOULD like to know when and if there will be a modem forthcoming to allow the VIC 20 to access the Micronet 800 service.

I understand the BBC and ZX Spectrum modems have had modems introduced, but have heard nothing about a VIC 20 modem. Is the VIC 20 screen display impossible to change to a Pong-compatible display? Will there only be a modem for the C64/128? Please help.

Andrew Lewis
Carrington
Dyfed

AT THE moment there are only plans to introduce a C64 version for Micronet 800. The feeling seems to be that the VIC 20 is not going to be around much longer, at least not long enough to make it worth investing in the design and manufacture of a modem connection.

Old chestnuts roasted

WHERE'S THE expansion port on the Commodore 64?

UNLIKE the Vic 20, the Commodore 64 has 64K of RAM that cannot be increased. There is therefore no expansion port.

ARE THERE two different sets of Commodore 64 on the market (there are two distinct colours and various nomenclature)?

YES, THERE are two sets of Commodore 64, NTSC and PAL. The NTSC is the American version and the PAL, the English version. The PAL version is the only one available in this country.

WHERE DO you connect the printer when the disk drive is being used?

THE PRINTER is connected directly into the serial port in the back of the disk drive unit.

WHEN TYPING in a program, why is it not possible to get reverse characters (i.e., Print 'C\nT\nR\nL\n-F\nA\nR\nC\nD\nE\n')?

THE LETTERS "ABCDE" will only appear in reverse when the program is run. THE POSIX location in the centre of the screen when addressed should show a white ball (see user guide), why doesn't it?

THE COLOUR memory needs to be POKED with a colour different to that of the background colour before the ball becomes visible.

CAN YOU use a pre-recorded software for the 8000 series on the Commodore 64? YOU CAN, but only if the programs don't refer to the screen and there are no machine code routines.

CAN YOU run Vic 20 software on the Commodore 64?

VIC 20 software is not compatible with the Commodore 64. In some circumstances if the program is in ordinary Basic and does not use POKED statements it will run. THE TANK, a UFO program in the rear of the Vic 20 user manual has a line 135 with 89 characters, why?

THE MAXIMUM allowed on one line is 40-22-88 characters, therefore you must abbreviate this line. This is made possible by either omitting all spaces or by using the shortened forms of the Basic key words, eg POKED H for the PRINT statement.

Do not, however, be too disappointed. Although MicroNet is an admirable idea, and has many applications for a business user, it does have many disadvantages for the home user.

It is relatively expensive to do buy the modem 61 because a subscriber to the service and it pay all the phone bills which go with regular access to the information. There is not yet a great deal of useful material on the service and it is frustratingly slow to download any software. We also feel that many home users are not happy having their telephones barred from ordinary calls while they are using the system.

It is probably better to resign yourself to having to wait until a faster cable networking system can be used. This is likely, however, in for several years away.

have yet to find a successful routine/program to enable 1.5K programs to be run using the 16K addition.

This is particularly frustrating as I am not able to expand conventional programs above the memory available. I am sure to home computer but "experts" have advised me that all the problems referred to can be overcome. Could you please advise me.

T. Blighman
Quarry Bank
Wyre Millands

I AM sure you do not need me to tell you that the main advantage of the 16K memory expansion is that you can run for longer and, hopefully, better programs. You will not, for example, find many adventure programs which will fit inside 1.5K.

Programs written in Basic alone do not need to be adapted to run on the expanded system. Although the Basic programs need to be reloaded the system will handle it automatically.

As you rightly imply, problems only arise when you have 1.5K programs which POKED to the screen or colour areas. To make these programs run try typing in the following POKEs before

loading the programs. I have not tried this routine, but it comes from a good source - an article by Mike Todd on page 30 of the Spring '81 VicNet catalog.

POKE 40101612 CUSTMOD
POKE 401219 CUSTMOD
POKE 401219 CUSTMOD
POKE 401219 CUSTMOD
POKE 401219 CUSTMOD
SYS 16212 CUSTMOD

More than the Basics

I HOPE to buy a computer, probably a Commodore 64. One thing I would like to know is what is machine code?

Paul Freeman
Plymouth

MACHINE code is essentially just a long list of numbers which are converted into binary by the computer.

If you need help with a technical query or problem write to:
Answer Back,
Commodore Horizons,
12-13 Little Newport
Street, London
WC2R 3BD

Much more on memory

I HAVE yet to observe the full advantages of the 16K Ram pack for the Vic 20.

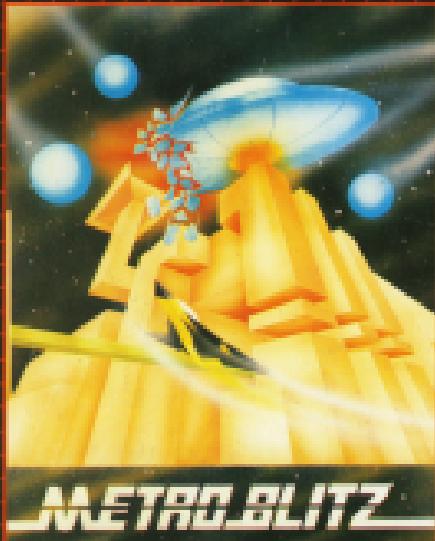
Other than the knowledge that its introduction relocates the Basic, screen and colour, i



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METROBLITZ

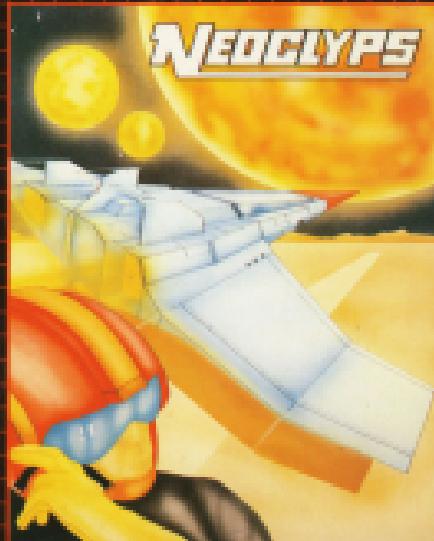
The object of this game is to defend your city against an onrushing of mutant aliens. Six different types of aliens invader the planet to the death, leaving no hope for their own kind.

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The object of this game is to blow up obstructions, destroy the heli-copter and catch the falling pilot, but do not kill the whale.

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P.S.S.